

TED02 – (Enviro Part 03) Greenhouse Effect

Name _____

1. E.3.1 **Describe** the greenhouse effect. (2) *Greenhouse gases allow the passage of incoming solar short-wavelength radiation but absorb the longer-wavelength radiation from the Earth. Some of the absorbed radiation is re-radiated back to Earth. **TOK:** Some people question the reality of climate change and question the motives of scientists who have “exaggerated” the problem. How do we assess the evidence collected and the models used to predict the impact of human activities?*
 - a. Provide the definition for the greenhouse effect:
 - b. How are we dependant on the greenhouse effect? Where does the name come from?
 - c. Where does the earth get its radiant energy from? How much of that energy makes it to earth? What wavelength (and category of the electromagnetic spectrum) is most dominant?
 - d. How does the earth regulate the temperature based on the night/day cycle?
 - e. What happens when molecules absorb or emit energy? What type of molecule can do this?
 - f. Diagram to explain how CO₂ (a symmetrical molecule) can have stretching and bending emissions due to the absorption of light:
2. E.3.2 **List** the main greenhouse gases and their sources, and discuss their relative effects. (3) *The greenhouse gases to be considered are CH₄, H₂O, CO₂, N₂O and chlorofluorocarbons (CFCs). Their effects depend on their abundance and their ability to absorb heat radiation.*

Factors that effect a greenhouse gases contribution to Global Warming					

- a. What is GWP and which two of the above factors contribute to the number?

GAS	GWP	% in Atm.	% Global W	Factors that Increase the amount of Gas	Extra Info
H ₂ O					
CO ₂					

CH₄					
N₂O					
CFC's					
O₃					

3. E.3.3 **Discuss** the influence of increasing amounts of greenhouse gases on the atmosphere. (3) *Examples include: thermal expansion of the oceans, melting of the polar ice-caps, floods, droughts, changes in precipitation and temperature, changes in the yield and distribution of commercial crops, and changes in the distribution of pests and disease-carrying organisms.*

a. Explain how each of the following would be a result of long-term global warming:

Effect	How Global Warming could impact:
Rising Sea Level	
Glacier Retreat	
Changing Patterns of Agriculture	

- b. CO₂ levels have been shown to increase of the last 50 years, show provide a small graph to show the trend and how further data can be added by studying the arctic ice:

- c. Use the provided graph to explain the correlation between temperature changes and CO₂, CH₄ levels:

